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# ARTICLE 34 AMENDMENTS

## CLAIMS

1. (Amended) A process for manufacturing a zeolite membrane  
on the surface of a porous tubular support with both ends  
5 open, which comprises:

carrying out hydrothermal reaction of a reaction  
solution for zeolite synthesis which contains a silica source  
and an alumina source in a reaction container;

in which reaction container the porous tubular support  
10 is placed vertically by holding the porous tubular support  
with a holding member located at the top and/or bottom of  
the reaction container under conditions of being not contact  
with the inner surface of the reaction container and leaving  
the top and bottom ends of the porous tubular support open,

15 wherein the porous tubular support placed vertically  
is completely immersed in the reaction solution which fills  
the reaction container, and

wherein the reaction is induced by heating the reaction  
solution.

20 2. (Cancelled)

3. (Cancelled)

4. (Amended) The process for manufacturing a zeolite  
membrane according to claim 1, wherein the porous tubular  
support is placed at one per the reaction container.

25 5. The process for manufacturing a zeolite membrane  
according to claim 1, wherein the reaction solution is heated  
in such

a manner that the convection of the reaction solution occurs over the full length of the porous tubular support placed in the reaction container.

6. (Cancelled)

5 7. (Amended) The process for manufacturing a zeolite membrane according to claim 1, wherein the level of the reaction solution filled in the reaction container is 2 to 30 cm above the top of the porous tubular support placed vertically in the container and immersed in the solution.

10 8. (Amended) The process for manufacturing a zeolite membrane according to claim 1, wherein the distance from the inner surface of the reaction container to the outer surface of the porous tubular support placed is set to be 2 to 25 mm

to carry out the reaction.

9. (Amended) The process for manufacturing a zeolite membrane according to claims 1, wherein a transparent solution with a turbidity of 300 NTU or less is prepared as the reaction  
5 solution and wherein the reaction is carried out at a temperature within the range of from the boiling temperature to the temperature lower than the boiling temperature by 50°C.

10. (Amended) The process for manufacturing a zeolite membrane according to claim 1, wherein the reaction solution  
10 is supplied to the reaction container at a temperature lower than 35°C and heated at a rate of 5 to 100°C/min in order to carry out the reaction.

11. (Amended) The process for manufacturing a zeolite membrane according to claim 1, wherein the reaction solution  
15 is provided as a suspension and the reaction is carried out at around the boiling temperature.

12. (Cancelled)

13. (Amended) An apparatus for manufacturing a zeolite membrane on the surface of a porous tubular support with both  
20 ends open, by hydrothermal reaction of a reaction solution for zeolite synthesis which contains a silica source and an alumina source, which comprises:

(a) a reaction container which accommodates the reaction solution, and has a sufficient shape and volume to  
25 place the whole of the porous tubular support therein and immerse it completely in the reaction solution received therein, under conditions that the porous tubular support

is not contact with the inner surface of the reaction container and leaves the top and bottom ends thereof open;

(b) a heating device for the reaction solution in the reaction container; and

5 (c) a holding device which holds the porous tubular support vertically in the reaction container under conditions of being not contact with the inner surface of the reaction container, and which is located at the top and/or bottom of the reaction container.

10 14. (Amended) The apparatus for manufacturing a zeolite membrane according to claim 13, wherein the holding device is located at the bottom of the reaction container, and has a structure on which the porous tubular support is placed vertically so that the bottom opening of the porous tubular  
15 support is not blocked up.

15. (Amended) The apparatus for manufacturing a zeolite membrane according to claim 13, wherein the distance from the inner surface of the reaction container to the outer surface of the porous tubular support placed therein is 2 to 25 mm.

20 16. (Amended) The apparatus for manufacturing a zeolite membrane according to claim 13, wherein the reaction container has

a height capable of providing conditions that the level of the reaction solution filled in the container is upper than the top of the porous tubular support immersed vertically in the reaction solution by 2 cm or more.

5 17. (Cancelled)

18. (Amended) A zeolite tubular separation membrane comprising a porous tubular support with both ends open and a zeolite membrane which is formed on the surface of the porous tubular support, wherein zeolite single crystals exposed on  
10 the surface of the zeolite membrane each have a growth axis almost perpendicular to the surface of the porous tubular support.

19. (Amended) The zeolite tubular separation membrane according to claim 18, wherein the membrane has grain boundary  
15 layers in the spaces among a plurality of zeolite single crystals.

20. (Amended) The zeolite tubular separation membrane according to claim 19, wherein the grain boundary layers are 2 to 50 nm in thickness.

20 21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (New) The apparatus for manufacturing a zeolite membrane according to claim 13, wherein the heating device  
25 for the reaction is a heating jacket which is provided on the periphery of the reaction container and the inside of which a heating medium can be fed to.